State of Louisiana
Department of Natural Resources
Coastal Restoration Division and
Coastal Engineering Division

2005 Operations, Maintenance, and Monitoring Report

for

NAOMI OUTFALL MANAGEMENT

State Project Number BA-03c
Priority Project Lists 5

June 2005
Jefferson & Plaquemine Parishes

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2005 Operations, Maintenance, and Monitoring Report
For
Naomi Outfall Management (BA-03c)

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Preface

The 2005 OM&M Report format is a streamlined approach which combines the Operations and Maintenance annual project inspection information with the Monitoring data and analyses on a project-specific basis. The new report format for 2005 includes monitoring data collected through December 2004, and annual Maintenance Inspections through June 2004. Monitoring data collected in 2005 and maintenance inspections conducted between July 2005 and June 2006 will be presented in the 2006 OM&M Report.

I. Introduction

In 1992, the state-funded Naomi- Siphon Diversion (BA-03) project was built to re-introduce (or divert) freshwater from the Mississippi River into the adjacent marshes through a set of eight siphons (Figure 1). The freshwater re-introduction was intended to replace some of the ecological functions supported by periodic over-bank flooding that occurred prior to the placement of the flood-control levee system. In order to manage freshwater from the diversion and to protect the area marshes from shoreline erosion and saltwater intrusion, the CWPPRA-funded Naomi Outfall Management Project (BA-03c) and the Barataria Bay Waterway East Bank Protection Project (BA-26) were completed in 2002. Monitoring of the state-funded BA-03 project was expanded in 1997 to include both the BA-03c and BA-26 project areas because they were adjacent to one another. Thus, for monitoring reporting purposes, all three projects are combined into one project and will be referred to in this report as the Naomi Outfall Management project. All references to "project area" will refer to the unified area of all three projects. Note that although the three projects are combined for monitoring purposes, they are not related for maintenance budgeting purposes.

The Naomi Outfall Management project area lies within the Barataria Basin in Jefferson and Plaquemines Parishes, Louisiana. The area is bordered by the Barataria Bay Waterway (BBW) and the town of Lafitte on the west and the Mississippi River back protection levee and the community of Naomi on the east. The area extends to the south of the Pen and includes the Dupre Cut portion of the Barataria Bay Waterway (Figure 2). The project comprises an area of approximately 26,956 ac (10,782 ha) of brackish and intermediate marsh.

The objective of the Naomi Outfall Management project is to protect the project area from continued degradation by managing freshwater introduced from the Mississippi River. In doing so the project also seeks to increase the benefit of sediment and nutrients introduced into the project area. Specific goals are (1) to manage the diverted freshwater from the Naomi siphon in the project area via the installation of two water control structures designed to reduce freshwater loss and saltwater intrusion.

Figure 1. Naomi siphons (BA-03) constructed in 1992 and funded by the stated of Louisiana. Mississippi River water is siphoned from the river intakes, discharged into a ponding area and distributed through a single channel into the surrounding marshes.

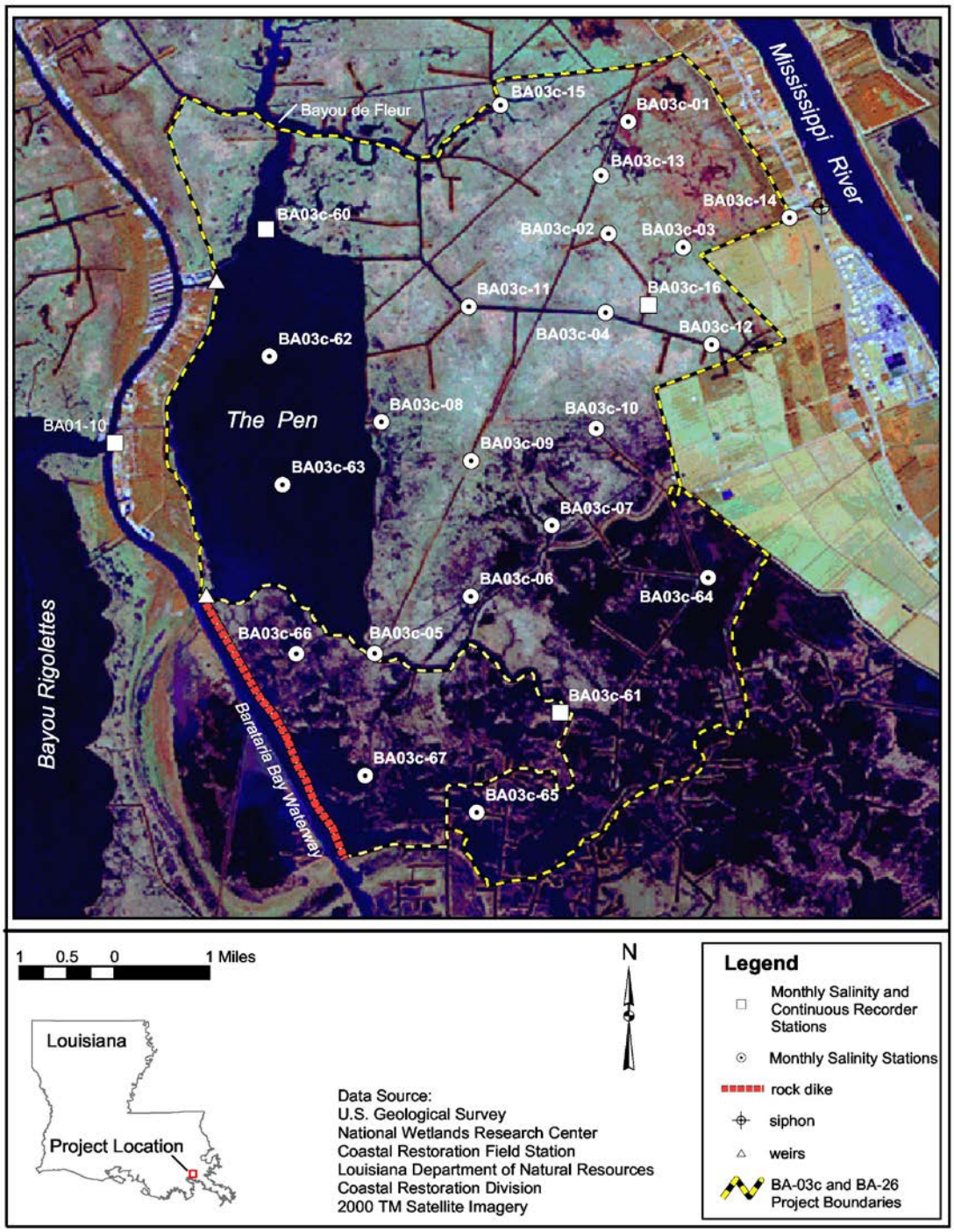

Figure 2. The Naomi (BA-03), Naomi Outfall Management (BA-03c) and Barataria Bay Waterway East (BA-26) project boundary, stations, and water control structures. Staff gauges are located at stations 1, 3, 6, 10, 11, 14, 16, 60, and 61.

The principal project features include:

Two fixed-crested weirs with boat bays (BA-03c) (figure 2).

II. Maintenance Activity

a. Project Feature Inspection Procedures

The purpose of the annual inspection of the Naomi Outfall Management Project (BA-03c) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, LDNR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (LDNR 2002). A summary of past operation and maintenance projects completed since completion of the Naomi Outfall Management Project are outlined in section III b.

An inspection of the Naomi Outfall Management Project (BA-03c) was held on March 9, 2005 under partly cloudy skies and approximate temperature of 62º F. Attendees included Barry Richard, Bill Boshart, Van Cook, and Jonathan Barmore from LDNR, and Brad Sticker and Melvin Rodrigue with NRCS. All parties met at the C&M Marina south of Lafitte, LA. The annual inspection began at approximately 8:30 a.m.

The field inspection included a complete visual inspection of the entire project site. Staff gauge readings were used to determine approximate elevations of water and other project features. Photographs were taken at each project feature and field inspection notes were completed in the field to record measurements and deficiencies.

b. Inspection Results

GOOSE BAYOU CANAL WEIR

Rock Riprap

There was no visible change in the structure from the last inspection. Rocks are still at approximately the same elevation and continuing to function as designed (appendix a, photograph 1).

Pilings

All pilings visually appeared to be damage-free and in good condition (see appendix a, photograph 1).

Warning Signs and Day Board Navigation Signs

All signs appeared to be in satisfactory condition with no indication of significant damage (see appendix a, photograph 1).

Navigation Aid Lights

All lights appear to be in good condition. It is anticipated that there will be a contract for periodic inspection and repair of lights in the near future (see appendix a, photograph 1).

BAYOU DUPONT CANAL WEIR

Rock Riprap

There was no visible change in the structure from the last inspection. Rocks are still at approximately the same elevation and continuing to function as designed.

Pilings

All of the warning light piling clusters were in good shape. Both of the warning sign pilings in the weir were missing (Photo No. 3). There was still a little of the piling showing above the water on the right side of the weir when you enter from the BBWW. This work is currently being contracted out. The rest of the warning sign pilings were in good condition.

Warning Signs and Day Board Navigation Signs

The navigation signs were in good condition. The two warning signs in the boat bay of the weir were gone. The work to replace these signs is currently being contracted out. The rest of the signs were in good condition.

Navigation Aid Lights

There are currently two lights out of commission at this structure (Photo No. 4 and 5). One has been unlatched and the battery removed and the other has had the light portion above the battery box removed completely. This work is currently being contracted out. As mentioned above there is a contract being worked on for regular inspection and repair of these lights.

c. Maintenance Recommendations

i. Immediate/ Emergency Repairs

As noted at each structure.

ii. Programmatic/ Routine Repairs

None

III. Operation Activity

a. Operation Plan

Siphon Operation

There are no active operations for the BA03c outfall project structures. However, the BA-03 siphons play an integral role in the monitoring aspect of BA03c given that siphon discharge increases the amount of freshwater introduced into the project area.

The operation plan called for the structure to have all eight pipes operating at just over 1,000 ft^3s^{-1} for all months except March and April when only two pipes are to be in operation (LDNR 1992). Daily siphon discharge from 1993-2004 was calculated from the head differential between the river, the immediate outfall area and the number of siphons in operation. Water elevation data were obtained from the Mississippi River gauge readings at Alliance LA, and the immediate outfall area staff gauge (BA03c-14). Operation data were obtained from Plaquemines Parish Government (PPG), which contain both the date and number of siphons in operation. It should be noted that PPG is responsible for all operations of the Naomi Siphon.

b. Actual Operations

Siphon Discharge

The siphons are capable of a maximum discharge of 2,144 ft^3s^{-1} with the optimum river stage and uninterrupted operation. However, through 2003, the structure was only in operation 69% of the time and averaged 798 ft^3s^{-1} when fully operational (i.e. all eight pipes), and 580 ft^3s^{-1} over the entire period, including times of no flow (Figure 3). In addition, siphon flow varied each year, due to limited operations, seasonal low river stages, and droughts. Below 1.5 feet NAVD88 on the Mississippi River gauge in Alliance, LA, the siphons began to lose prime and are rendered inoperable. Additional obstacles to operation were: marine fisheries, tropical storms, oil spills, maintenance problems, and staffing limitations within PPG.

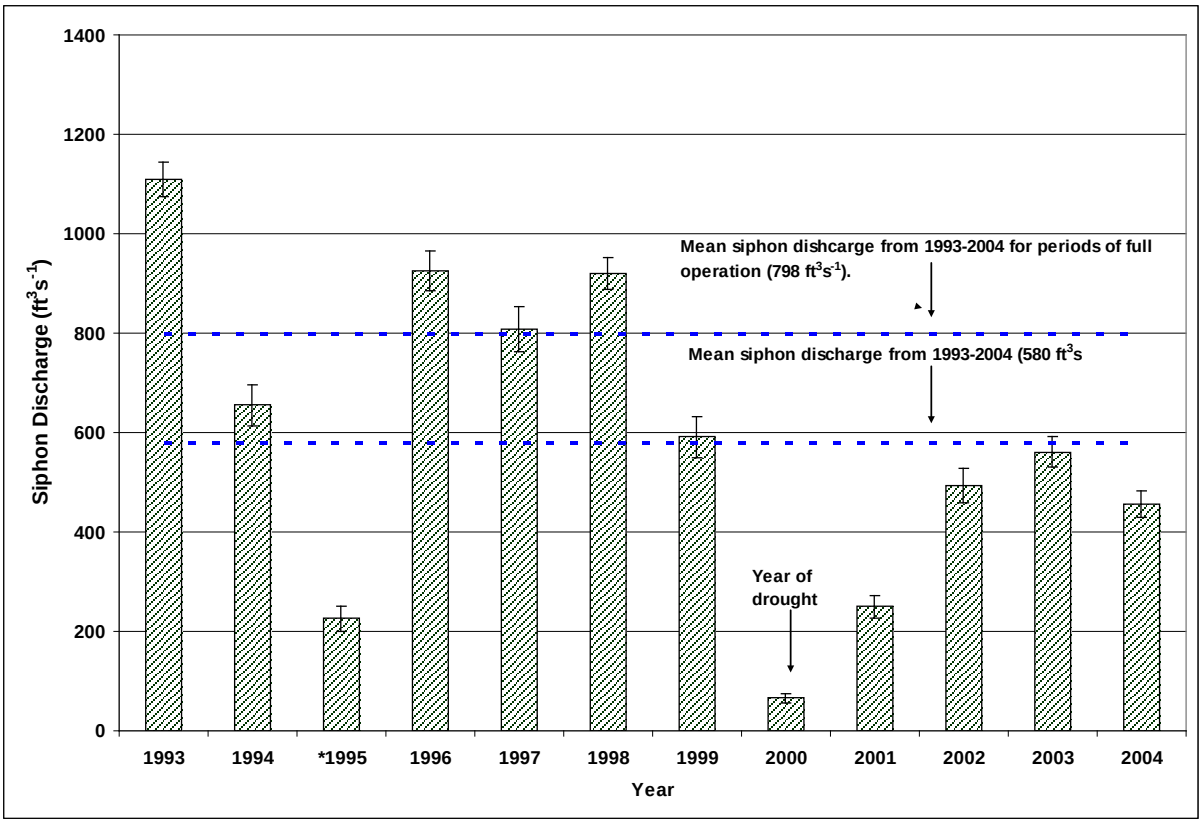

Figure 3. BA-03c yearly mean (±SE) siphon discharge from 1993 -2004. Dotted lines represent mean discharge during period when siphons were in full operation and the overall average for 1993-2004. Daily siphon discharge was estimated from the Mississippi River gauge at Alliance LA, the immediate staff gauge in the outfall area, and the number of siphons in operation. *Siphons were not operational for 9 months during 1995.

IV. Monitoring Activity

a. Monitoring Goals

The objective of the project was to protect the project area from continued degradation by managing the diverted freshwater from the Naomi siphon in the project area. This was achieved with the installation of two water control structures designed to reduce freshwater loss and saltwater intrusion.

The following goals will contribute to the evaluation of the above objectives:

1. Reduce mean project area salinity.
2. Improve growing conditions and increase relative abundance of fresh-to-intermediate marsh species.
3. Reduce the rate of conversion of marsh to open water in project area.

b. Monitoring Elements

Salinity

Salinity was monitored hourly at 3 continuous recorder stations from June 1999 – December 2004 (see Figure 2). Discrete salinity was monitored monthly at 16 stations from 1992 – 1999 and at 24 stations from 1999 – 2004. Data were used to characterize the spatial and temporal variation in salinity throughout the project area. Salinity data will continue to be collected through 2012.

Water elevation

Hourly water level data were taken with the three continuous recorder stations from 1999 -2004, and discrete water level measurements were recorded monthly at seven staff gauges from 1992-2000 and at nine gauges from 2000 – 2004 (see Figure 2). Data were used to characterize the spatial and temporal variation in water level throughout the project area. Water level data collection will continue through 2012.

Vegetation

Species composition and relative abundance of emergent vegetation were quantified using techniques described in Steyer et al. (1995). Twenty-one stations were visually monitored in 1992 (pre-construction) and in 1995 (post-construction). Forty plots ($4m^2$) were surveyed in years 1997, 2000, 2003, and will continue in 2006, 2009, and 2012.

Habitat Mapping

In order to document vegetated and non-vegetated areas, color-infrared aerial photography (1:12,000 scale with ground controls) was obtained following procedures outlined in Steyer et al. (1995). Photography was obtained in 1993 (pre-construction) and 2000 (post-construction) and will be collected in 2008 and 2017.

c. Preliminary Monitoring Results and Discussion

Salinity

Mean daily salinity measured at the continuous recorders was lower during periods when all siphons were in either major or minor operation vs. no-flow, indicating that the siphons are capable of reducing salinity in the project area (Figure 4). However, salinity during these periods was influenced by factors other than siphon operation, particularly normal seasonal variability within the Barataria Basin (Swenson and Swarzenski 1995; Wiseman et. al. 1990). For example, salinity is generally lowest throughout the Barataria Basin during the spring which corresponds to the period of highest flow for the Mississippi River. During a drought from September 1999 through December 2000 mean yearly salinity levels in the project area increased greatly while siphon operation decreased substantially due to low river stage (Figure 5).

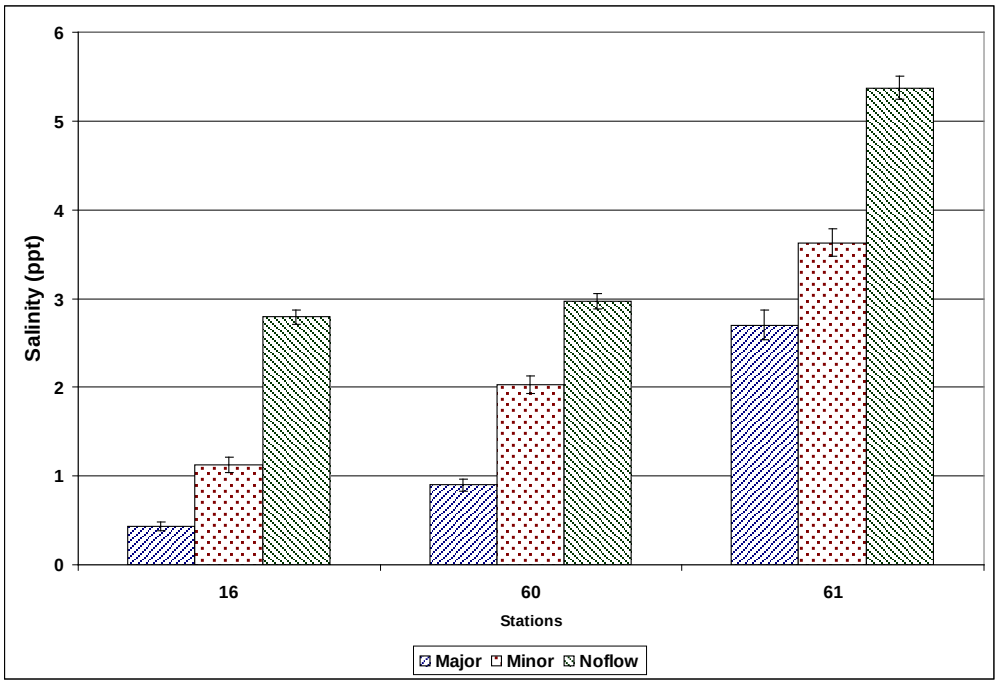

Figure 4. BA-03c mean (±SE) salinity for the period 1999-2004 for 3 operational categories at YSI continuous recorder stations (major discharge >1,072 ft^3s^{-1}; minor discharge >0, <1,072 ft^3s^{-1}; no flow = 0 ft^3s^{-1}).

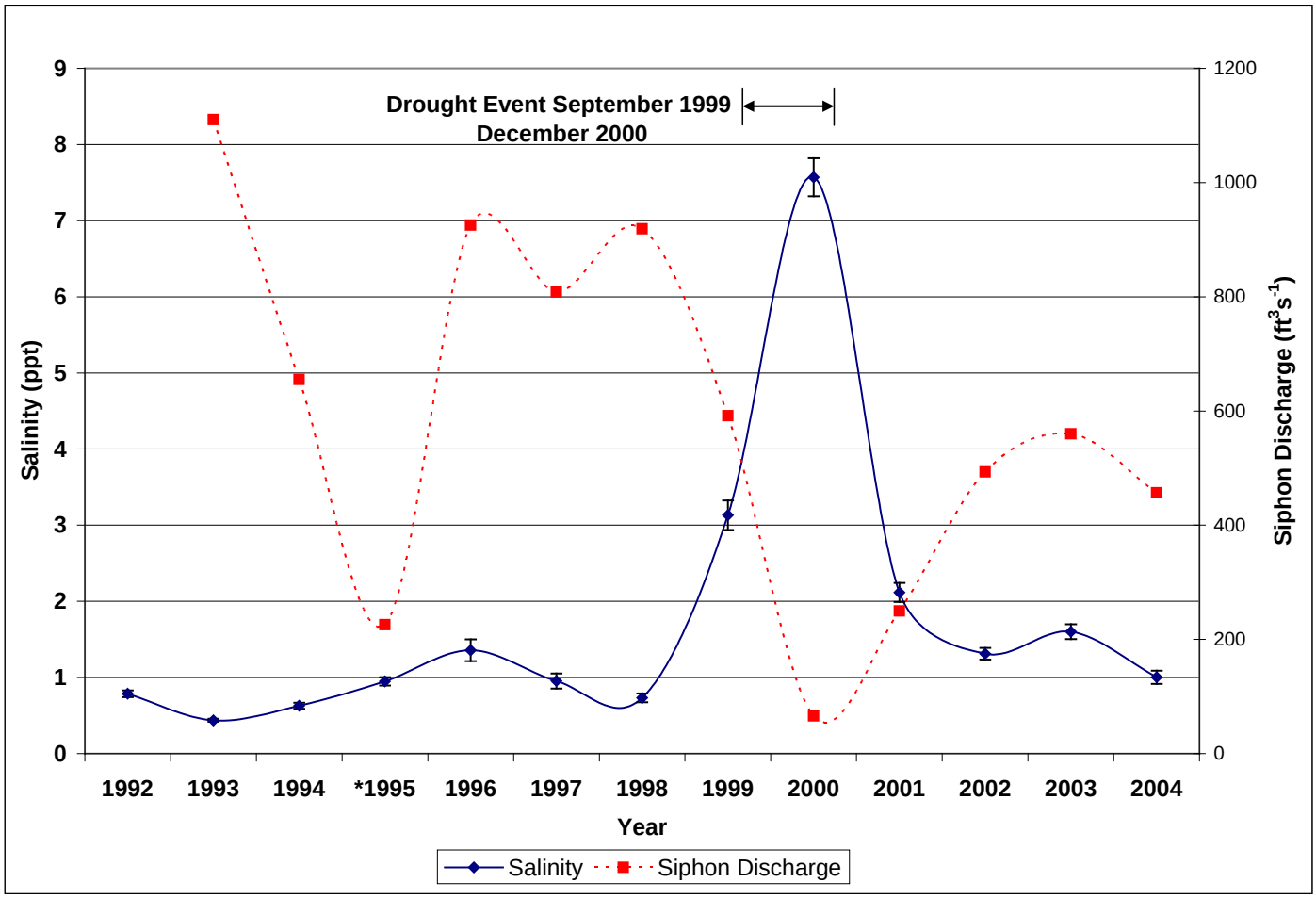

Figure 5. BA-03c Naomi Outfall Management project yearly mean (±SE) salinity and siphon discharge. Salinity was measured at 16 discrete monthly hydrologic stations for the period 1992-2003 and at 24 stations from 1999 – 2003. *Siphons were not operational for 9 months during 1995.

Siphon operation is a function of river stage; thus, ability to control salinity during drought or normal low river stages (e.g. late summer and fall) was limited.

The drought had a confounding effect on the results of the analysis of pre- and post-construction salinity data for the outfall management project. Pre-construction salinity levels were higher than post-construction levels at continuous recorder stations both within and just outside the project area (Figure 6). Thus, to factor out the drought effect, three separate statistical tests - one for each monitoring station - were performed to judge whether the weir construction had an effect on salinity in the project area. Each test compared pre- and post-construction salinity measured at each continuous monitoring station within the project to the reference salinity measured at station BA01-10, a Barataria Bay Waterway station, figure 2, located outside the project.

The test is a simple non-parametric BACI (Before-After Control Impact) model anova using the method described by Stewart-Oaten et al. (1986) and Smith et al. (1993). The less-powerful, but relatively assumption-free *median test* was chosen over the Wilcoxon-Mann-Whitney. The tests are depicted graphically in figures 7, 8, and 9.

This analysis does not use a sole overall BACI analysis because doing so would entail using a parametric test based on grossly-violated assumptions. The data measured at these stations proved intractable to ordinary normalizing and variance-stabilizing transformations. Breaking the question into three pieces allows a non-parametric comparison of the pre-construction population of paired differences between project and reference with the post construction population of paired differences.

Evidence of a statistically-significant project impact comes in the form of a significant *interaction* between the main effects. By this method, such an interaction is indicated by a statistically-significant median test on the two populations (pre-construction differences *vs.* pos-construction differences). Graphically, the same interaction is revealed by lines out of parallel in figures 7, 8, and 9.

Station 16 and 60 showed a statistically-significant impact ($p < 0.0001$). This shows up graphically as converging lines in figure 7 and 8. Although salinity decreased at both station sites and reference site, salinity decreased less (see line slope) at project site BA03c-16 and BA03c-60 than at the reference site (steeper slope). However, the difference post-construction is smaller indicating the salinity did not decrease as much in the project area as the reference area but actually decreased at a slower rate than the reference area. This impact, although highly significant statistically, equates to a difference in salinity of only one part per thousand.

Station 61 showed a statistically significant impact ($p < 0.0001$). Again, this shows up as converging lines in figure 9. Here, salinity decreased more at the project site than at the reference site, meaning that the project had the intended impact. This impact,

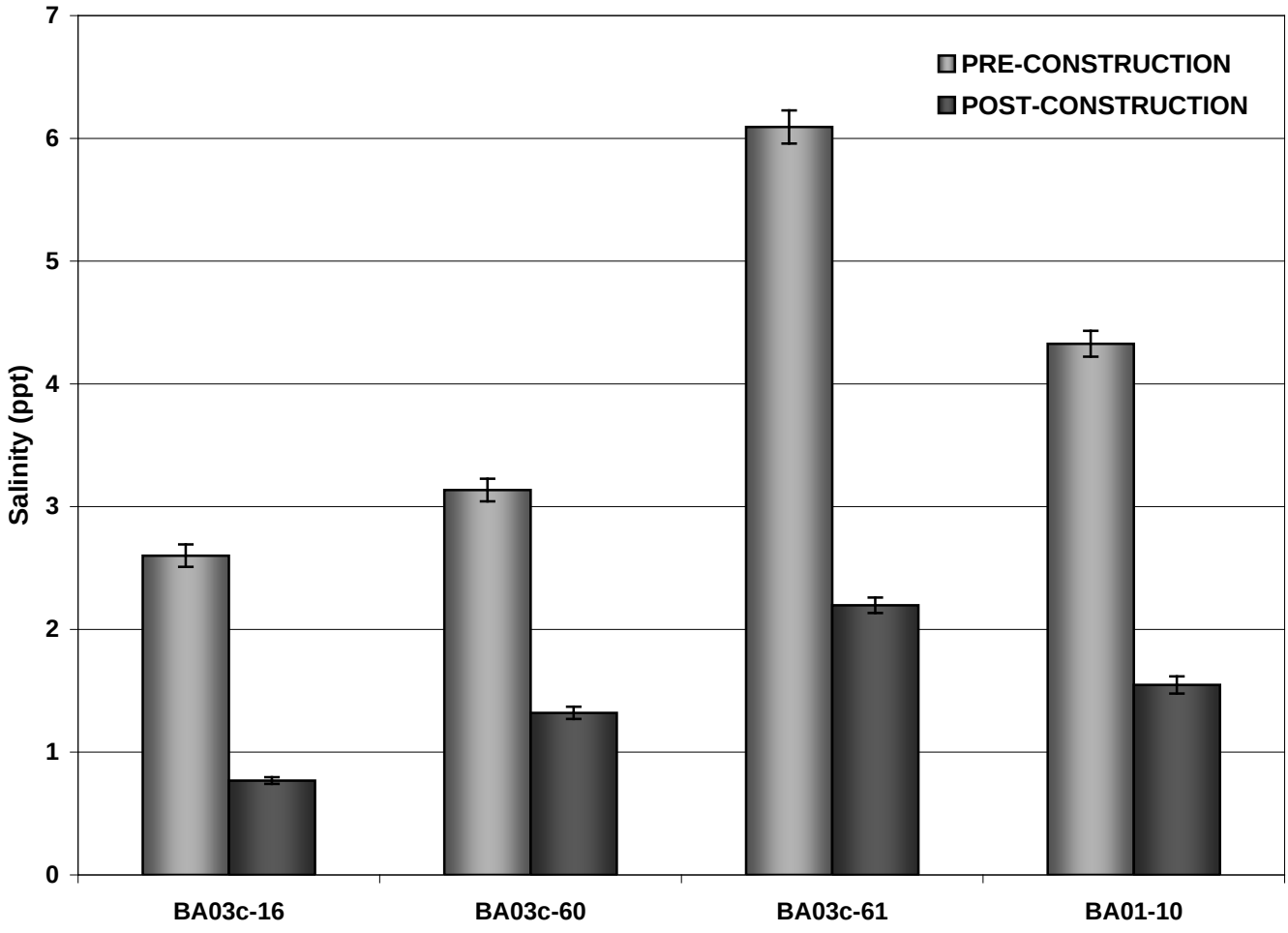

Figure 6. Mean daily salinity during pre-construction (05/01/1999 – 08/15/2002) and post-construction (08/15/2002 – 12/31/2004) for project and reference (BA01-10) stations.

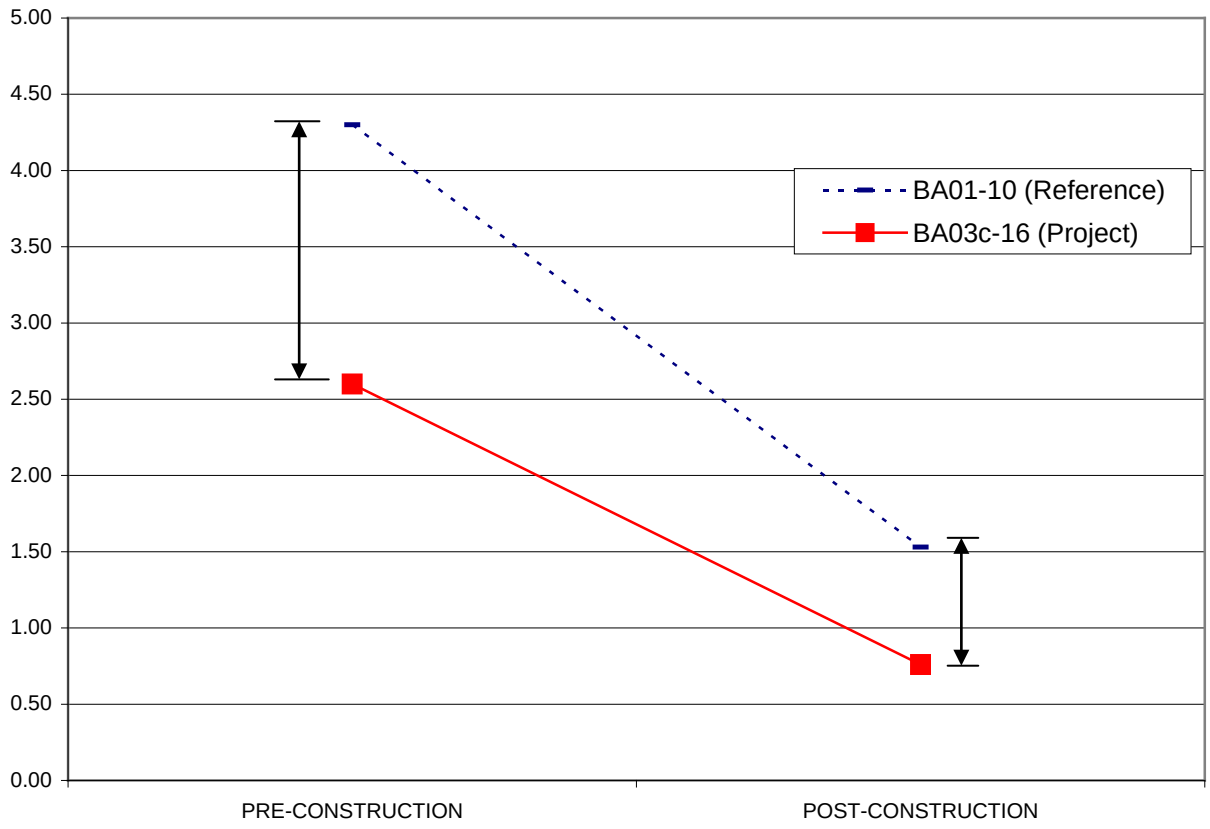

Figure 7. Interaction graph depicting mean comparison of pre-construction and post-construction salinity levels for station BA03c16 and BA01-10.

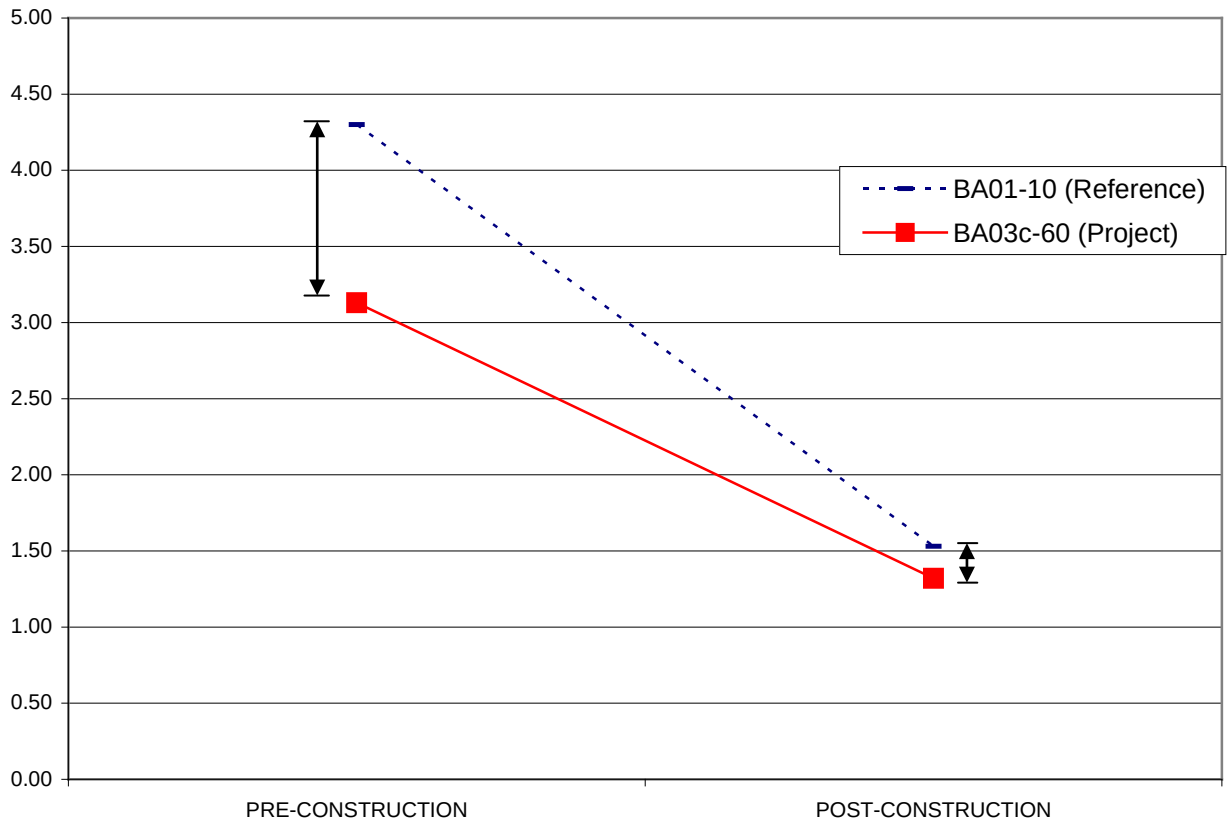

Figure 8. Interaction graph depicting mean comparison of pre-construction and post-construction salinity levels for BA03c-60 and BA01-10.

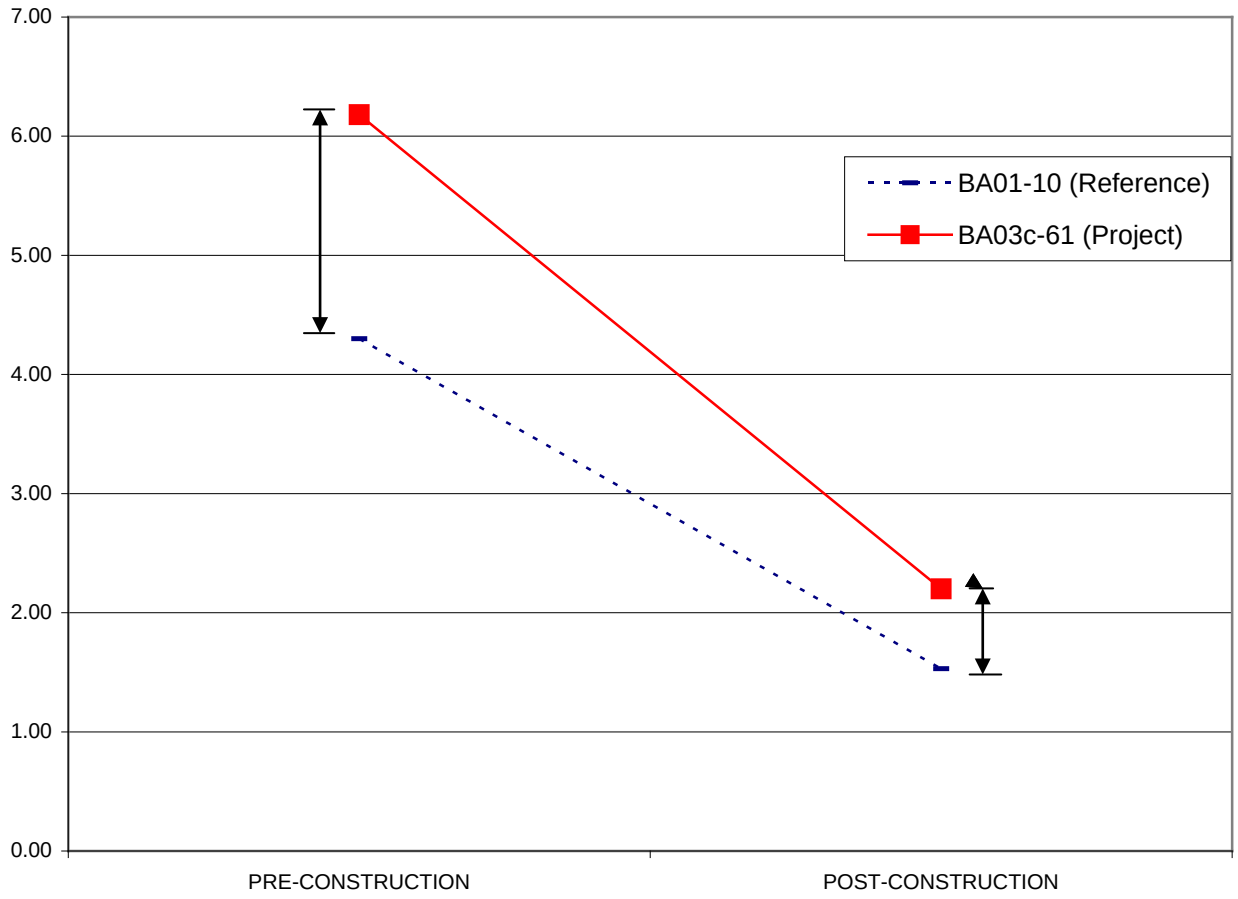

Figure 9. Interaction graph depicting mean comparison of pre-construction and post-construction salinity levels for BA03c-61 and BA01-10.

although highly significant statistically, equates to a decrease in salinity of less than 1.5 parts per thousand.

Water Elevation

Water level from monthly staff gauge readings collected during siphon operations were significantly higher (P<.0001) at the monitoring station nearest the outfall structure (station 14) than the remaining stations. During major flow conditions (>1,072 ft^3s^{-1}) mean water level at station 14 was 27.2 inches above mean water level measured than during no-flow conditions. Nonetheless, data from the remainder of the stations indicated water surface elevations dissipated quickly with distance from the discharge area, and few differences in water level were noted among flow categories for other stations outside of the immediate outfall area (Boshart 2003).

Pre and post-construction continuous water levels for the outfall management project indicated that water levels changed very little. Differences between pre-construction and post-construction water levels at station 16 and 60, were ≤ 1 inch, while that of stations 10 (the reference station) and 61 were < 3 inches. (Figure 10).

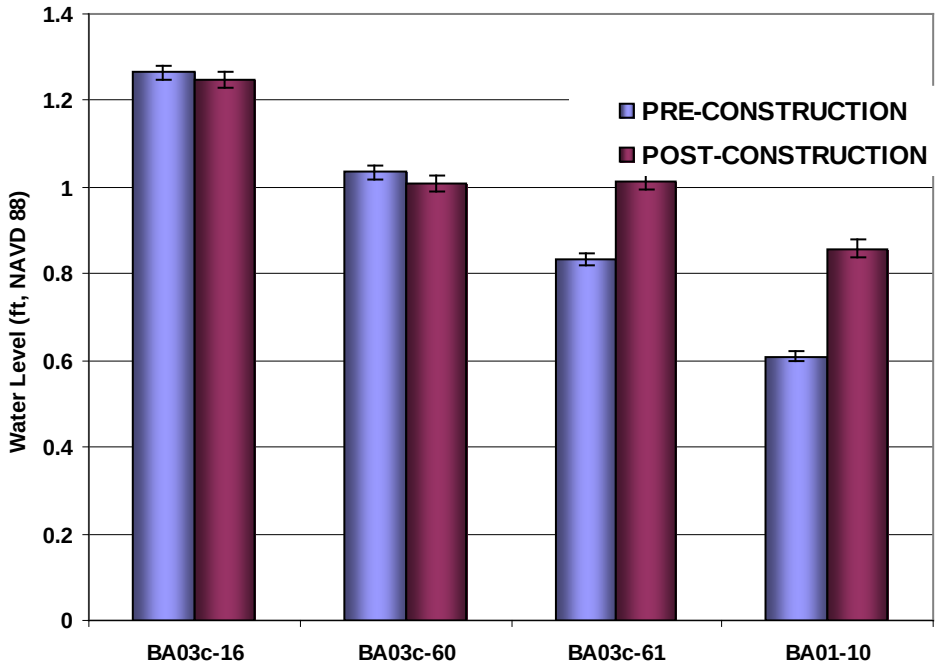

Figure 10. Mean monthly water levels during pre-construction (05/01/1999 – 08/15/2002) and post-construction (08/15/2002 – 12/31/2004) for project and reference area.

Vegetation

Vegetation surveys were conducted in years 1992, 1995, 1997, 2000, and 2003. The 1992 and 1995 vegetation surveys indicated that the northeast portion of the project area was comprised of fresh to intermediate marsh with *Sagittaria lancifolia* as the dominant species. The southern portion of the project area was comprised of brackish marsh with *Spartina patens* as the dominant species. However, vegetation data from the 1992 and 1995 surveys can not be directly compared with the 1997, 2000, and 2003 surveys due to different methodologies, times of year, and sampling sites used in the latter years. For the 1997, 2000 and 2003 surveys *Spartina patens* had the highest percent cover and frequency of occurrence over the entire project area (Figure 11 Table 1). In the southern part of the project area, *S. patens* had a frequency of 100% for all stations during all three surveys, whereas frequencies in the northern area were 17%, 26%, and 23% for the three surveys. Other species in the northern area that were high in abundance during the three surveys were *Eleocharis* spp., *S. lancifolia*, and *Schoenoplectus* spp., which are all typically associated with less saline environments. *Eleocharis* spp. and *Schoenoplectus* spp. were located in both the northern and southern portions of the project area during the three surveys, while *S. lancifolia*, did not occur at any stations within the southern area. In 1997 and 2003, species richness was consistent in the north and south with both areas containing nearly equal numbers of species. In 2000, however, there was a 65% decrease in the number of species observed in the southern area. This decrease may have been due to drought conditions which prevailed from January 1999 through April 2001. In 2003, species richness increased considerably in the southern stations indicating a recovery of the vegetation community from the drought. Salinity followed the vegetative community in a trend towards a freshwater environment. This was most evident from the salinity data for station 61, the southern most continuous recorder, which indicated a reduction in salinity when compared to the reference station. These changes were likely facilitated by both the siphon and outfall management control structures.

Habitat Mapping

Aerial photography from 1993 and 2000 was being analyzed and will be presented in future reports.

V. Conclusions

a. Project Effectiveness

Freshwater introduced by the siphons as a part of the state/PPG funded BA-03 project reduced salinity when the siphons were operated. However, operations were limited due to a number of factors, and thus the full potential benefit of the siphon was not realized. However, some evidence was found to suggest that the outfall management structures installed as a part of the BA-03c Naomi Outfall Management project had some effect on reducing the mean project salinity. Although salinity decreased less at the northern continuous recorder stations 16 and 60 than at the reference site, evidence of post construction salinity reduction was found at the southern most

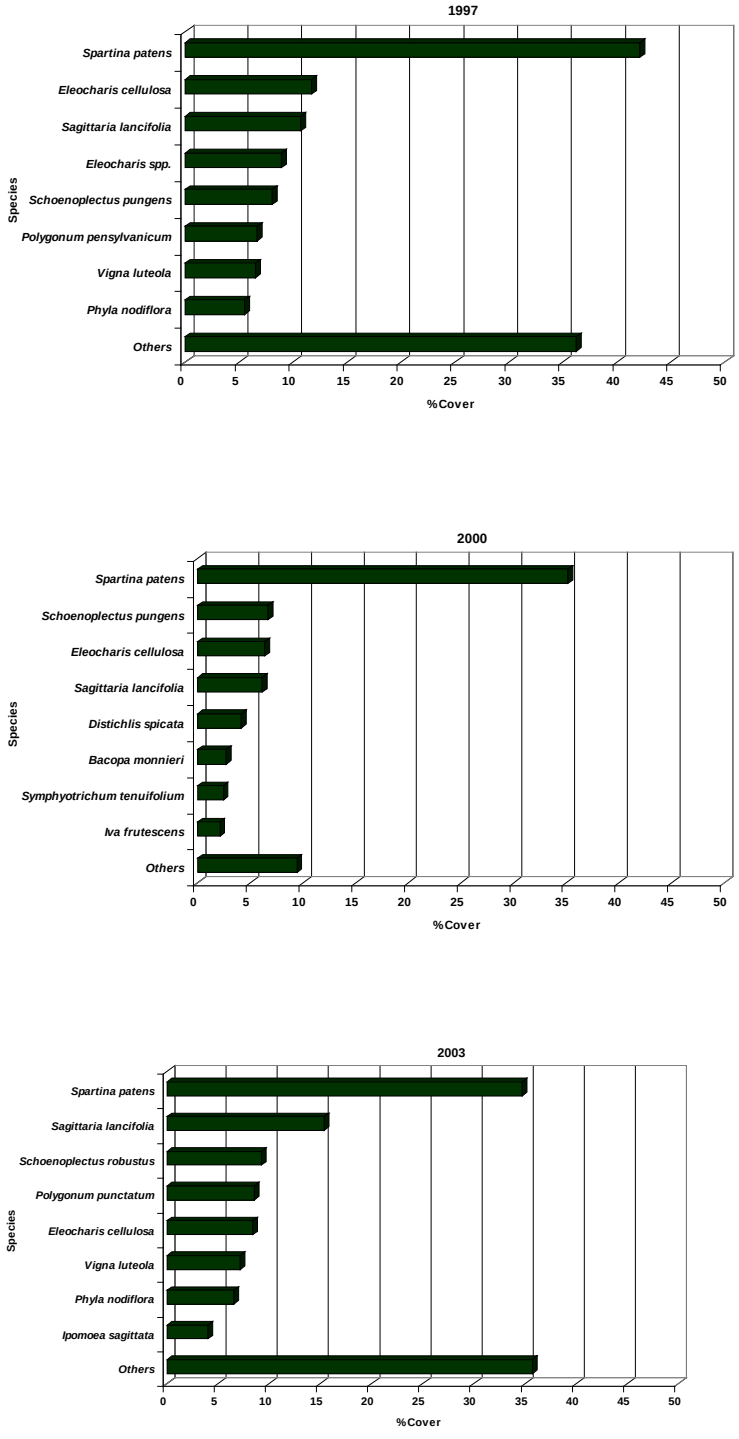

Figure 11. Mean percent cover of dominant vegetative species across all 4m^2 plots during 1997, 2000 (pre-outfall structure construction) and 2003 (post-outfall structure construction) vegetation surveys in the BA-03c Naomi Outfall Management Project Area.

Table 1. The frequency at which each species occurs and number in the Naomi Outfall Management Project (BA-03c).

Scientific Name	Common Name	Occurrence (%)		
		1997	2000	2003
Alternanthera philoxeroides	Aligatorweed	10.00	15.00	7.50
Amaranthus australis	Southern amaranth	2.50	.	15.00
Ammannia coccinea	Valley redstem	.	2.50	.
Ammannia sp.	Redstem	2.50	.	.
Ammannia latifolia	Pink redstem	.	.	10.00
Andropogon glomeratus	Bushy bluestem	17.50	7.50	.
Baccharis halimifolia	Eastern baccharis	15.00	10.00	5.00
Baccharis sp.	Baccharis	2.50	.	.
Bacopa monnieri	Coastal waterhyssop	10.00	17.50	22.50
Cuscuta indecora	Bigseed dodder	.	.	2.50
Cyperus compressus	Poorland flatsedge	.	.	15.00
Cyperus sp.	Flatsedge	12.50	15.00	.
Cyperus odoratus	Fragrant flatsedge	12.50	10.00	20.00
Distichlis spicata	Seashore saltgrass	2.50	25.00	10.00
Echinochloa crus-galli	Barnyardgrass	2.50	.	.
Echinochloa walteri	Coast cockspur	.	2.50	10.00
Eichhornia crassipes	Water hyacinth	2.50	.	.
Eleocharis sp.	Spikerush	27.50	.	5.00
Eleocharis cellulosa	Gulf Coast spikerush	40.00	27.50	45.00
Eleocharis parvula	Dwarf spikesedge	2.50	2.50	20.00
Fuirena squarrosa	Dwarf spikesedge	.	.	2.50
Galium tinctorium	Spikerush	.	.	7.50
Hibiscus sp.	Hairy umbrella-sedge	12.50	.	.
Hibiscus moscheutos	Crimsoneyed rosemallow	5.00	.	.
Hydrocotyle sp.	Hydrocotyle	35.00	10.00	32.50
Ipomoea sagittata	Saltmarsh morninglory	30.00	37.50	42.50
Iva frutescens	Bigleaf sumpweed	2.50	10.00	5.00
Juncus effusus	Common rush	5.00	.	.
Juncus roemerianus	Needlegrass rush	2.50	2.50	2.50
Kosteletzkya virginica	Virginia saltmarsh mallow	.	2.50	2.50
Lemna minor	Common duckweed	.	5.00	.
Ludwigia sp.	Primrose-willow	2.50	.	.
Ludwigia microcarpa	Smallfruit primrose-willow	2.50	.	.
Lythrum lineare	Wand lythrum	.	.	37.50
Mikania scandens	Climbing hempvine	7.50	.	.
Panicum repens	Torpedograss	.	2.50	7.50
Paspalum distichum	Knotgrass	.	.	2.50
Phyla nodiflora	Turkey tangle fogfruit	45.00	25.00	40.00
Pluchea camphorata	Camphor pluchea	17.50	5.00	20.00
Pluchea foetida	Stinking camphorweed	2.50	.	.
Polygonum sp.	Knotweed	20.00	.	.
Polygonum pensylvanicum	Pennsylvania smartweed	37.50	.	.
Polygonum punctatum	Dotted smartweed	2.50	5.00	57.50
Sacciolepis striata	American cupscale	5.00	17.50	.
Sagittaria lancifolia	Bulltongue	45.00	47.50	50.00
Sagittaria platyphylla	Delta arrowhead	5.00	.	.
Salvinia minima	Water spangles	2.50	2.50	.
Schoenoplectus americanus	Olney bulrush	.	.	5.00
Schoenoplectus pungens	Common threesquare	35.00	25.00	.
Schoenoplectus robustus	Sturdy bulrush	.	.	37.50
Setaria sp.	Bristlegrass	17.50	.	.
Setaria magna	Giant bristlegrass	2.50	.	2.50
Setaria parviflora	Knotroot bristlegrass	5.00	2.50	5.00
Solidago sempervirens	Seaside goldenrod	17.50	15.00	5.00
Spartina alterniflora	Smooth cordgrass	2.50	10.00	7.50
Spartina patens	Marshay cordgrass	65.00	75.00	70.00
Sphenoclea zeylanica Gaertn.	Chickenspike	2.50	.	.
Sporobolus	Dropseed	7.50	.	.
Symphyotrichum subulatum	Coastal Waterhyssop	27.50	.	17.50
Symphyotrichum tenuifolium	Perennial saltmarsh aster	35.00	40.00	.
Thelypteris palustris	Eastern marsh fern	10.00	2.50	7.50
Typha latifolia	Broadleaf cattail	.	2.50	.
Typha sp.	Cattail	.	.	2.50
Vigna luteola	Hairypod cowpea	45.00	.	37.50
Zizaniopsis miliacea	Giant cutgrass	.	.	2.50
Number of species		48	32	39

continuous recorder stations (station 61). This was possibly a result of the outfall structures design to manage (by way of boat bays located at the northwest and southwest ends of the pen) the flow of freshwater from the diversion and to direct it towards the south.

Similar effects of salinity are evident from the post construction effect on the projects vegetation community. From 1992 to 1999, prior to the construction of the outfall management structures, vegetation communities within the project area increased in fresher species, which was likely a result of the diversion. However, the vegetation community was affected by the drought in 2000, with some stations reverting from fresher to more saline species (Evers and Sasser 2002). Since construction of the outfall management structures and continuation of the freshwater flow from the siphons, vegetation reverted back towards a fresher and more diverse community especially in the southern project area. One of the goals of this project was to increase relative abundance of intermediate to fresh marsh plant species. That goal is being met in the project as a whole.

b. Recommended Improvements

The following recommendations pertain to Naomi Siphon (BA-03) operation. They are included here because the improvements to siphon operation would have a corresponding improvement on the effectiveness of the BA-03C project. These recommendations will be discussed with the Plaquemines parish Government (PPG), as PPG owns, operates, and maintains the siphon. There are no budgeted funds available in the CWPPRA-approved O&M budget for BA-03C for Siphon operation.

A contract for regular inspection and repair of the warning and navigation lights would be helpful for the maintenance of these features. It has been noticed that these lights are very sensitive and are apparently a prime target for vandalism. There also needs to be a better system for locking the batteries into the battery box of the lights. The other problem which is currently being fixed is the damaged pilings at the Bayou Dupont Canal Weir. This makes at least three occasions where one of the two warning pilings was hit. We are hoping to remedy this problem by placing buoys in the same location as the pilings. These buoys should handle a collision a little better, but will be monitored closely to make sure they perform as planned. It may be necessary to look into installing these in areas of high traffic for future projects instead of the pilings with the signs on them.

c. Lessons Learned

An alternative to more expensive modeling would have been to re-visit volumetric water budget analysis using pre- and post- construction data to test assumptions and revise the analysis. This type of analysis is less expensive and takes less time than hydrodynamic and salinity transport numerical modeling further increasing its utility for other projects.

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Appendix A
Inspection Photographs

Photo No. 1

Goose Bayou Canal Weir looking East

Photo No. 2
Bayou Dupont Canal Weir looking west;
Note the lack of warning signs

Photo No. 3
Damaged Piling on the South of the Bayou Dupont Canal Weir

Photo No. 4
Damaged light at Bayou Dupont on the East side

Photo No. 5
Damaged light at Bayou Dupont on the West side

Appendix B
Three Year Budget Projection

Naomi Outfall Management / BA-03c / PPL5			
Three-Year Operations & Maintenance Budgets 07/01/2005 - 06/30/2008			
Project Manager	O & M Manager	Federal Sponsor	Prepared By
	Van Cook	*NRCS*	*Barry Richard*
	2005/2006	**2006/2007**	**2007/2008**
Maintenance Inspection	$3,174.00	$3,257.00	$3,341.00
Structure Operation	$-	$-	$-
Administration	$-	$-	$-
Maintenance/Rehabilitation			
05/06 Description:	Annual nspection/Warning Sign and Nav Light Maintenance		
E&D	$-		
Construction	$-		
Maintenance & Repair	$22,995.42		
Sub Total - Maint. And Rehab.	$22,995.42		
06/07 Description:	Annual Inspection/Nav Light Maintenance		
E&D		$-	
Construction		$-	
Maintenance & Repair		$3,000.00	
	Sub Total - Maint. And Rehab.	$3,000.00	
07/08 Description:	Annual Inspection/Nav Light Maintenance		
E&D			$-
Construction			$-
Maintenance & Repair			$3,000.00
		Sub Total - Maint. And Rehab.	$3,000.00
	2005/2006	**2006/2007**	**2007/2008**
Total O&M Budgets	**$26,169.42**	**$6,257.00**	**$6,341.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2005/2006

Naomi Outfall Management / BA-03c / PPL 5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,174.00	**$3,174.00**
General Structure Maintenance	LUMP	1	$3,000.00	**$3,000.00**
Engineering and Design	LUMP	1	$1,420.42	**$1,420.42**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	1	$825.00	**$825.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	1	$2,000.00	$2,000.00
FEDERAL SPONSER Admin.	LUMP	1	$2,000.00	$2,000.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$4,000.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument	EACH	0	$0.00	$0.00
Staff Gauge / Recorders	EACH	0	$0.00	$0.00
Marsh Elevation / Topography	LUMP	0	$0.00	$0.00
TBM Installation	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings	EACH	0	$0.00	$0.00
OTHER				$0.00
			TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	2	$3,000.00	$6,000.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	0	$0.00	$0.00
Materials		LUMP	0	$0.00	$0.00
Mob / Demob		LUMP	1	$6,000.00	$6,000.00
Contingency		LUMP	1	$1,750.00	$1,750.00
General Structure Maintenance		LUMP	0	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$13,750.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$26,169.42**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2006/2007

Naomi Outfall Management / BA-03c / PPL 5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,257.00	**$3,257.00**
General Structure Maintenance	LUMP	1	$3,000.00	**$3,000.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	0	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument		EACH	0	$0.00	$0.00
Staff Gauge / Recorders		EACH	0	$0.00	$0.00
Marsh Elevation / Topography		LUMP	0	$0.00	$0.00
TBM Installation		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	0	$0.00	$0.00
Materials		LUMP	0	$0.00	$0.00
Mob / Demob		LUMP	0	$0.00	$0.00
Contingency		LUMP	0	$0.00	$0.00
General Structure Maintenance		LUMP	0	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$6,257.00**

OPERATION AND MAINTENANCE BUDGET WORKSHEET 2007/2008

Naomi Outfall Management / BA-03c / PPL 5

DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	ESTIMATED TOTAL
O&M Inspection and Report	EACH	1	$3,341.00	**$3,341.00**
General Structure Maintenance	LUMP	1	$3,000.00	**$3,000.00**
Engineering and Design	LUMP	0	$0.00	**$0.00**
Operations Contract	LUMP	0	$0.00	**$0.00**
Construction Oversight	LUMP	0	$0.00	**$0.00**

ADMINISTRATION

LDNR / CRD Admin.	LUMP	0	$0.00	$0.00
FEDERAL SPONSER Admin.	LUMP	0	$0.00	$0.00
SURVEY Admin.	LUMP	0	$0.00	$0.00
OTHER				$0.00
			TOTAL ADMINISTRATION COSTS:	**$0.00**

MAINTENANCE / CONSTRUCTION

SURVEY

SURVEY DESCRIPTION:					
Secondary Monument		EACH	0	$0.00	$0.00
Staff Gauge / Recorders		EACH	0	$0.00	$0.00
Marsh Elevation / Topography		LUMP	0	$0.00	$0.00
TBM Installation		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL SURVEY COSTS:	**$0.00**

GEOTECHNICAL

GEOTECH DESCRIPTION:					
Borings		EACH	0	$0.00	$0.00
OTHER					$0.00
				TOTAL GEOTECHNICAL COSTS:	**$0.00**

CONSTRUCTION

CONSTRUCTION DESCRIPTION:					
Rip Rap	LIN FT	TON / FT	TONS	UNIT PRICE	
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
	0	0.0	0	$0.00	$0.00
Filter Cloth / Geogrid Fabric		SQ YD	0	$0.00	$0.00
Navagation Aid		EACH	0	$0.00	$0.00
Signage		EACH	0	$0.00	$0.00
General Excavation / Fill		CU YD	0	$0.00	$0.00
Dredging		CU YD	0	$0.00	$0.00
Sheet Piles (Lin Ft or Sq Yds)			0	$0.00	$0.00
Timber Piles (each or lump sum)			0	$0.00	$0.00
Timber Members (each or lump sum)			0	$0.00	$0.00
Hardware		LUMP	0	$0.00	$0.00
Materials		LUMP	0	$0.00	$0.00
Mob / Demob		LUMP	0	$0.00	$0.00
Contingency		LUMP	0	$0.00	$0.00
General Structure Maintenance		LUMP	0	$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
OTHER				$0.00	$0.00
				TOTAL CONSTRUCTION COSTS:	**$0.00**

TOTAL OPERATIONS AND MAINTENANCE BUDGET: **$6,341.00**

Appendix C

Field Inspection Notes

FIELD INSPECTION CHECK SHEET

Project No. / Name: Naomi Outfall Management

Structure No. **Goose Bayou Canal**

Structure Description: Stone Weir

Type of Inspection: Annual

Date of Inspection: 3/10/2005   Time: 8:30

Inspector(s): Richard, Cook, Boshart, Barmore, Sticker, Rodrigue

Water Level: Inside: N/A   Outside: Approx. 0.5 ft

Weather Conditions: Clear skies, 65° F

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Rock Riprap	Good	None	N/A	#1	
Creosote Piling	Excellent	None	None	#1	
Warning Signs and Day Board Navigation Signs	Excellent	None	None	#1	
Navigation Aid Lights	Good	None	None	#1	We need to check and see if they are actually working.
Warning Buoys	Good	None	None	#1	
Vandalism	-	None	-	-	There appeared to be no signs of vandalism either on the lights or the structure.

FIELD INSPECTION CHECK SHEET

Project No. / Name: Naomi Outfall Management

Structure No.: **Bayou Dupont Canal**

Structure Description: Stone Weir

Type of Inspection: Annual

Date of Inspection: 3/10/2005 Time: 8:30

Inspector(s): Richard, Cook, Boshart, Barmore, Sticker, Rodrigue

Water Level: Inside: N/A Outside: Approx. 0.5 ft

Weather Conditions: Clear skies, 65° F

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Rock Riprap	Good	None	N/A	#2,3	Rock appears to be holding up well.
Creosote Piling	Fair	See Observations	None	#2,3	Two were missing.
Warning Signs and Day Board Navigation Signs	Poor	See Observations	None	#2,3	The two warning signs in the boat bay have been knocked down by some water vessel.
Navigation Aid Lights	Fair	See Observations	None	#2,4,5	Having trouble with vandalism of lights. One broke off and another open with battery gone
Warning Buoys	Good	See observations	None	#2,3	They are no longer attached to pilings since those are gone; but they are holding position well.
Vandalism	-	See observations	-	#2,4,5	The lights are constantly being broken into and the batteries are always missing.